



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,456	07/23/2003	Paris Smaragdis	MERL-1464	2550
22199 7590 06/27/2008 MITSUBISHI ELECTRIC RESEARCH LABORATORIES, INC. 201 BROADWAY 8TH FLOOR CAMBRIDGE, MA 02139				
EXAMINER				
OPSASNICK, MICHAEL N				
ART UNIT		PAPER NUMBER		
2626				
MAIL DATE		DELIVERY MODE		
06/27/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/626,456

Applicant(s)

SMARAGDIS, PARIS

Examiner

MICHAEL N. OPSASNICK

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on received on 4/23/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1,2,4-9 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As per the most recent interpretation of the Interim Guidelines regarding 35 U.S.C. 101, claims 1,2,4-9 define non-statutory processes because they merely manipulate an abstract idea (the mathematical calculation of signal representative matrices) without a claimed limitation to produce a useful, concrete, tangible result. If the acts of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter (Benson, 409 U.S. at 71-72, 175, USPQ at 676). Furthermore, claims define nonstatutory processes if they simply manipulate abstract ideas (Warmerdam, 33 F.3d at 1360,31 USPQ2d at 1759). As for guidance to areas of statutory subject matter, see 35 U.S.C. 101 Interim Guidelines (with emphasis of the Clarification of Interim Guidelines For Examination of Patent Applications for Subject Matter Eligibility); as an example, in Alappat, the claimed output smooth waveform (consisted of lighting pixels on an oscilloscope/display) is a useful, concrete, tangible, final result; in Arrhythmia, the claimed useful, concrete, tangible, final

result represented the condition of a patient's heart; in State Street, the claimed useful, concrete, tangible, final result was data output that represented a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades. Claims rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. As per the most recent interpretation of the Interim Guidelines regarding 35 U.S.C. 101, claims 1-24,34 define non-statutory processes because they merely manipulate an abstract idea (the mathematical manipulation of data (voice information and text)) without a claimed limitation to a produce a useful, concrete, tangible result. If the acts of a claimed process manipulate only numbers, abstract concepts or ideas, or signals representing any of the foregoing, the acts are not being applied to appropriate subject matter (Benson, 409 U.S. at 71-72, 175, USPQ at 676). Furthermore, claims define nonstatutory processes if they simply manipulate abstract ideas (Warmerdam, 33 F.3d at 1360,31 USPQ2d at 1759). Lastly, in evaluating claims in view of 35 U.S.C. 101, the "limited to the technological arts" test is no longer valid (see Annex III of the Interim Guidelines). Claim 25 is also non-statutory under the most recent interpretation of the Interim Guidelines regarding 35 U.S.C.101 because this claim is toward a computer program, and as claimed, does not define any structural and functional interrelationship between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized (Warmerdam, 33 F.3d at 1361,31 USPQ2d at 1760; Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1,2,4-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Saul(6401064).

As per claims 1,5,6,7 Saul (6401064) teaches a method for detecting a non-stationary signal by acquiring the signal (as non-stationary signals representative consonants –col. 1 lines 45-49; and in multidimensional space – col. 1 lines 35-40); constructing a non-negative matrix including columns representing features of the non-stationary signal at different instances of time (col. 3 line 65 – col. 4 line 5; including temporal information – col. 6 lines 10-20); producing characteristics profiles and temporal profiles of the non-stationary signal by factoring the non-negative matrices (col. 5 lines 45-52 – the non-negative matrix $g(x)$ – (col. 3 line 65 – col. 4 line 5) is factored into A) $\sigma_{i \dots sub.i \dots sup.1}$ (equation 6), which represents extracted characteristic features of the speech signal, and B) $\Phi_{i \dots sub.i \dots sup.2}(x)$, which represents a relationship of the time based segments -- as defined in col. 6 lines 30-40).

As per claims 2,4,8,9, Saul (6401064) teaches M total of bins/slots along with an $R \times M$ matrix (col. 4 lines 4-25,col. 4 lines 30-34, col. 4 lines 42-67; col. 6 lines 22-47). As to the matrix size $M = L/2 + 1$ for a signal of length L, examiner notes that this is a function of sampling

to avoid aliasing (twice sampling rate) - which is met by Saul (see col. 3 lines 5-16 -- Saul discloses the well known digital signal processing concept of twice sampling rate, which would inherently lead to $M=L/2 + 1$). Furthermore, examiner notes that the matrix of Saul is square in nature, however, examiner notes that it is inherent as a design choice to not necessarily have a square matrix (as evidenced by applicants background disclosure, Non-negative matrix factorization (NMF) is an alternative technique for dimensionality reduction, see, Lee, et al, "Learning the parts of objects by non-negative matrix factorization," Nature, Volume 401, pp.788- 791, 1999.).

Response to Arguments

4. Applicant's arguments received 3/12/2008 have been fully considered but they are not persuasive.

As per applicants arguments against the 35 U.S.C. 101 rejections, examiner disagrees and argues:

1)the final result of the claimed invention does not produce a useful, concrete, tangible result (the final result is a mathematical calculation, and what is not claimed, is a useful, concrete, tangible result);

2) as to the arguments that "claimed is a computer related process that physically transforms something that exists outside of the computer", examiner argues that the current claim scope does not define any structural and functional interrelationship between the computer, acquiring a signal, and producing a useful, concrete, tangible

result; as currently claimed, claim elements are missing which would permit the computer's functionality to be realized (Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760; Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035).

3) as per the 35 U.S.C. 101 Interim Guidelines, the main test is if the final result is useful, concrete, tangible (not so much "limited to a practical application in the technological arts" nor "safe harbor").

As per applicants arguments that Saul does not teach producing characteristic and temporal profiles by factoring the non-negative matrix, examiner points to the rejection above further clarifying the portions of Saul which meets these claim limitations. As per applicants arguments on page 9 stating that Saul is non-analogous art, examiner argues that in the referred to section of Saul in the previous office action, the function $g(x)$ is defined as $D \times D$ matrix everywhere non-negative, which met the claim scope at that time. The office action has been modified in response to the amendment to claim 1, which further explains how the Saul reference meets the current claim scope of claim 1. As per the arguments on page 10 with respect to $m \times r$ dimensionality, and $M=L/2+1$, examiner notes the new commentary in the office action above.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see related art listed on the PTO-892 form.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Opsasnick, telephone number (571)272-7623, who is available Tuesday-Thursday, 9am-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Richemond Dorvil, can be reached at (571)272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Michael N. Opsasnick/
Primary Examiner, Art Unit 2626
6/23/08